Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.   (Canceled)

2.   (Canceled)

3.   (Currently Amended) ~~The method of Claim 2, wherein calculating a protection path further comprises:~~A method for determining a protection path for a failure event link in an optical network of a set of nodes interconnected by a set of links, the method comprising:
        receiving a set of link metrics corresponding to wavelength reservations for a set of protected links on a set of protection path links;
        calculating a set of widths using the set of link metrics, each width corresponding to a capacity of a protection path link to protect the failure event link, wherein a width of a protection path link is a normalized difference between a maximum wavelength reservation on the protection path link and a wavelength reservation on the protection path link for the failure event link;
        calculating a protection path including protection path links for the failure event link using the set of widths;
        determining a set of possible protection paths;

determining a protection path maximum width for the set of possible protection paths; and

selecting a protection path from the set of possible protection paths using the protection path maximum width.

4.   (Original)   The method of Claim 3, wherein determining a protection path maximum width further comprises:

determining a set of possible protection path widths from the set of possible protection paths; and

selecting a maximum possible protection path width from the set of possible protection path widths.

5.   (Original)   The method of Claim 4, wherein the width of a possible protection path is a minimum of widths of the protection path links included in the possible protection path.

6.   (Original)   The method of Claim 3, wherein the protection path maximum width is a minimum width of the protection path links included in the possible protection paths.

7.   (Original)   The method of Claim 3 wherein selecting a protection path from the set of possible protection paths further comprises randomly selecting a protection path if the protection path maximum width is greater than zero.

8.   (Original)   The method of Claim 3 wherein selecting a protection path from the set of possible protection paths further comprises:

determining the number of protection path links of zero width included in each possible protection path; and

selecting the possible protection path with the fewest number of protection path links of zero width.

9.   (Canceled)

10.   (Canceled)

11.   (Currently Amended) ~~The method of Claim 10, wherein calculating a protection path further comprises:~~A method for establishing a protected working path from a source node to a terminal node in an optical network of a set of nodes interconnected by a set of links, the method comprising:

determining by the source node a working path including a set of working path nodes and a set of working path links;

transmitting to a first working path node from the source node a setup message including the protected working path;

determining a working path link linking the source node and the first working path node;

receiving a set of link metrics corresponding to wavelength reservations for a set of protected links on a set of protection path links;

calculating a set of widths using the set of link metrics, each width corresponding to a capacity of a protection path link

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to protect the working path link, wherein a width of a protection path link is a normalized difference between a maximum wavelength reservation on the protection path link and the wavelength reservation on the protection path link for the working path link;

calculating a protection path including protection path links for the working path link using the set of widths;

determining a set of possible protection paths;

determining a protection path maximum width for the set of possible protection paths; and

selecting a protection path from the set of possible protection paths using the protection path maximum width.

12. (Original)   The method of Claim 11, wherein determining the protection path maximum width further comprises:

determining a possible protection path width for each of the possible protection paths in the set of possible protection paths; and

selecting a maximum possible protection path width.

13. (Original)   The method of Claim 12, wherein the width of a possible protection path is a minimum of widths of the protection path links included in the possible protection path.

14. (Original)   The method of Claim 11, wherein determining the protection path maximum width further comprises

determining a minimum width of the protection path links included in the possible protection paths.

15. (Original) The method of Claim 11, wherein selecting a protection path from the set of possible protection paths further comprises randomly selecting a protection path from the set of possible protection paths if the protection path maximum width is greater than zero.

16. (Original) The method of Claim 11 wherein selecting a protection path from the set of possible protection paths further comprises:

determining the number of protection path links of zero width included in each possible protection path; and

selecting the possible protection path with the fewest number of protection path links of zero width.

17. (Canceled)

18. (Canceled)

19. (Currently Amended) ~~The method of Claim 18, wherein calculating a protection path further comprises:~~<u>A method for establishing a protected working path from a source node to a terminal node in an optical network of a set of nodes interconnected by a set of links, the method comprising:</u>

receiving by a node from a prior node a first setup message including a working path including a set of working path nodes and a set of working path links;

transmitting to a working path node from the node a second setup message including the protected working path;

determining a working path link linking the node and the working path node;

receiving a set of link metrics corresponding to wavelength reservations for a set of protected links on a set of protection path links;

calculating a set of widths using the set of link metrics, each width corresponding to a capacity of a protection path link to protect the working path link, wherein a width of a protection path link is a normalized difference between a maximum wavelength reservation on the protection path link and the wavelength reservation on the protection path link for the working path link;

calculating a protection path including protection path links for the working path link using the set of widths;

determining a set of possible protection paths;

determining a protection path maximum width for the set of possible protection paths; and

selecting a protection path from the set of possible protection paths using the protection path maximum width.

20. (Original)   The method of Claim 19, wherein determining the protection path maximum width further comprises:

determining a possible protection path width for each of the possible protection paths in the set of possible protection paths; and

selecting a maximum possible protection path width.

21. (Original) The method of Claim 20, wherein the width of a possible protection path is a minimum of widths of the protection path links included in the possible protection path.

22. (Original) The method of Claim 19, wherein determining the protection path maximum width further comprises determining a minimum width of the protection path links included in the possible protection paths.

23. (Original) The method of Claim 19, wherein selecting a protection path from the set of possible protection paths further comprises randomly selecting a protection path from the set of possible protection paths if the protection path maximum width is greater than zero.

24. (Original) The method of Claim 19, wherein selecting a protection path from the set of possible protection paths further comprises:

determining the number of protection path links of zero width included in each possible protection path; and

selecting the possible protection path with the fewest number of protection path links of zero width.

25.   (Canceled)

26.   (Canceled)

27.   (Currently Amended) ~~The data processing system of Claim 26, wherein the program instructions for calculating a protection path further include:~~A data processing system adapted to determine a protection path for a failure event link in an optical network of a set of nodes interconnected by a set of links, comprising:

a processor; and

a memory operably coupled to the processor and having program instructions stored therein, the processor being operable to execute the program instructions, the program instructions including:

receiving a set of link metrics corresponding to wavelength reservations for a set of protected links on a set of protection path links;

calculating a set of widths using the set of link metrics, each width corresponding to a capacity of a protection path link to protect the failure event link, wherein a width of a protection path link is a normalized difference between a maximum wavelength reservation on the protection path link and a wavelength reservation on the protection path link for the failure event link;

calculating a protection path including protection path links for the failure event link using the set of widths;

determining a set of possible protection paths;

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determining a protection path maximum width for the set of possible protection paths; and

selecting a protection path from the set of possible protection paths using the protection path maximum width.

28. (Original)   The data processing system of Claim 27, wherein the program instructions for determining a protection path maximum width further include:

determining a set of possible protection path widths from the set of possible protection paths; and

selecting a maximum possible protection path width from the set of possible protection path widths.

29. (Original)   The data processing system of Claim 28, wherein the width of a possible protection path is a minimum of widths of the protection path links included in the possible protection path.

30. (Original)   The data processing system of Claim 27, wherein the protection path maximum width is a minimum width of the protection path links included in the possible protection paths.

31. (Original)   The data processing system of Claim 27, wherein the program instructions for selecting a protection path from the set of possible protection paths further include randomly selecting a protection path if the protection path maximum width is greater than zero.

32. (Original) The data processing system of Claim 27, wherein the program instructions for selecting a protection path from the set of possible protection paths further include:

determining the number of protection path links of zero width included in each possible protection path; and

selecting the possible protection path with the fewest number of protection path links of zero width.

33. (Canceled)

34. (Canceled)

35. (Currently Amended) ~~The data processing system of Claim 34, wherein the program instructions for calculating a protection path further include:~~A data processing system adapted to establish a protected working path from a source node to a terminal node in an optical network of a set of nodes interconnected by a set of links, comprising:

a processor; and

a memory operably coupled to the processor and having program instructions stored therein, the processor being operable to execute the program instructions, the program instructions including:

determining by the source node a working path including a set of working path nodes and a set of working path links;

transmitting to a first working path node from the source node a setup message including the protected working path;

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determining a working path link linking the source node and the first working path node;

receiving a set of link metrics corresponding to wavelength reservations for a set of protected links on a set of protection path links;

calculating a set of widths using the set of link metrics, each width corresponding to a capacity of a protection path link to protect the working path link, wherein a width of a protection path link is a normalized difference between a maximum wavelength reservation on the protection path link and the wavelength reservation on the protection path link for the working path link;

calculating a protection path including protection path links for the working path link using the set of widths,

determining a set of possible protection paths;

determining a protection path maximum width for the set of possible protection paths; and

selecting a protection path from the set of possible protection paths using the protection path maximum width.

36.   (Original)   The data processing system of Claim 35, wherein the program instructions for determining the protection path maximum width further include:

determining a possible protection path width for each of the possible protection paths in the set of possible protection paths; and

selecting a maximum possible protection path width.

37.   (Original)   The data processing system of Claim 36, wherein the width of a possible protection path is a minimum of widths of the protection path links included in the possible protection path.

38.   (Original)   The data processing system of Claim 35, wherein the program instructions for determining the protection path maximum width further include determining a minimum width of the protection path links included in the possible protection paths.

39.   (Original)   The data processing system of Claim 35, wherein the program instructions for selecting a protection path from the set of possible protection paths further include randomly selecting a protection path from the set of possible protection paths if the protection path maximum width is greater than zero.

40.   (Original)   The data processing system of Claim 35, wherein the program instructions for selecting a protection path from the set of possible protection paths further include:
    determining the number of protection path links of zero width included in each possible protection path; and
    selecting the possible protection path with the fewest number of protection path links of zero width.

41.   (Canceled)

42.   (Canceled)

43.   (Currently Amended) ~~The data processing system of Claim 42, wherein the program instructions for calculating a protection path further include:~~A data processing system adapted to establish a protected working path from a source node to a terminal node in an optical network of a set of nodes interconnected by a set of links, comprising:

a processor; and

a memory operably coupled to the processor and having program instructions stored therein, the processor being operable to execute the program instructions, the program instructions including:

receiving by a node from a prior node a first setup message including a working path including a set of working path nodes and a set of working path links;

transmitting to a working path node from the node a second setup message including the protected working path;

determining a working path link linking the node and the working path node;

receiving a set of link metrics corresponding to wavelength reservations for a set of protected links on a set of protection path links;

calculating a set of widths using the set of link metrics, each width corresponding to a capacity of a protection path link to protect the working path link, wherein a width of a protection path link is a normalized difference between a maximum wavelength reservation on the protection path link and

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the wavelength reservation on the protection path link for the working path link;

calculating a protection path including protection path links for the working path link using the set of widths;

determining a set of possible protection paths;

determining a protection path maximum width for the set of possible protection paths; and

selecting a protection path from the set of possible protection paths using the protection path maximum width.

44. (Original)   The data processing system of Claim 43, wherein the program instructions for determining the protection path maximum width further include:

determining a possible protection path width for each of the possible protection paths in the set of possible protection paths; and

selecting a maximum possible protection path width.

45. (Original)   The data processing system of Claim 44, wherein the width of a possible protection path is a minimum of widths of the protection path links included in the possible protection path.

46. (Original)   The data processing system of Claim 43, wherein the program instructions for determining the protection path maximum width further include determining a minimum width of the protection path links included in the possible protection paths.

47. (Original)   The data processing system of Claim 43, wherein the program instructions for selecting a protection path from the set of possible protection paths further include randomly selecting a protection path from the set of possible protection paths if the protection path maximum width is greater than zero.

48. (Original)   The data processing system of Claim 43, wherein the program instructions for selecting a protection path from the set of possible protection paths further include:

determining the number of protection path links of zero width included in each possible protection path; and

selecting the possible protection path with the fewest number of protection path links of zero width.

49. (Canceled)

50. (Canceled)

51. (Currently Amended) ~~The computer-readable storage medium of Claim 50, wherein the program instructions for calculating a protection path further comprise:~~ A computer-readable storage medium embodying computer program instructions for execution by a computer, the computer program instructions adapting a computer to determine a protection path for a failure event link in an optical network of a set of nodes interconnected by a set of links, the computer instructions comprising:

receiving a set of link metrics corresponding to wavelength reservations for a set of protected links on a set of protection path links;

calculating a set of widths using the set of link metrics, each width corresponding to a capacity of a protection path link to protect the failure event link , wherein a width of a protection path link is a normalized difference between a maximum wavelength reservation on the protection path link and a wavelength reservation on the protection path link for the failure event link;

calculating a protection path including protection path links for the failure event link using the set of widths;

determining a set of possible protection paths;

determining a protection path maximum width for the set of possible protection paths; and

selecting a protection path from the set of possible protection paths using the protection path maximum width.

52. (Original)   The computer-readable storage medium of Claim 51, wherein the program instructions for determining a protection path maximum width further comprise:

determining a set of possible protection path widths from the set of possible protection paths; and

selecting a maximum possible protection path width from the set of possible protection path widths.

53. (Original)   The computer-readable storage medium of Claim 52, wherein the width of a possible protection path is a

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minimum of widths of the protection path links included in the possible protection path.

54. (Original) The computer-readable storage medium of Claim 52, wherein the protection path maximum width is a minimum width of the protection path links included in the possible protection paths.

55. (Original) The computer-readable storage medium of Claim 51, wherein the program instructions for selecting a protection path from the set of possible protection paths further comprise randomly selecting a protection path if the protection path maximum width is greater than zero.

56. (Original) The computer-readable storage medium of Claim 51, wherein the program instructions for selecting a protection path from the set of possible protection paths further comprise:

determining the number of protection path links of zero width included in each possible protection path; and

selecting the possible protection path with the fewest number of protection path links of zero width.

57. (Original) A method for establishing a protected working path from a source node to a terminal node in an optical network of a set of nodes interconnected by a set of links, the method comprising:

determining by the source node a working path including a set of working path nodes and a set of working path links;

transmitting to a first working path node from the source node a setup message including the protected working path;

determining a working path link linking the source node and the first working path node;

receiving a set of wavelength reservations for a set of protected links on a set of protection path links;

calculating a set of a normalized differences between a maximum wavelength reservation on a protection path link and a wavelength reservation on the protection path link for the working path link;

determining a set of possible protection paths for the working path link;

determining a set of possible protection path widths from the set of possible protection paths;

selecting a maximum possible protection path width from the set of possible protection path widths;

if the number of possible protection paths is greater than one and the possible protection path maximum width is greater than zero then randomly selecting a protection path;

if the number of possible protection paths is greater than one and the protection path maximum width is equal to zero then performing the following:

determining the number of protection path links of zero width included in each possible protection path; and

selecting the possible protection path with the fewest number of protection path links of zero width; and

if the number of possible protection paths is equal to one then selecting the one possible protection path.

58. (Original)   A data processing system adapted to establish a protected working path from a source node to a terminal node in an optical network of a set of nodes interconnected by a set of links, comprising:

a processor; and

a memory operably coupled to the processor and having program instructions stored therein, the processor being operable to execute the program instructions, the program instructions including:

determining by the source node a working path including a set of working path nodes and a set of working path links;

transmitting to a first working path node from the source node a setup message including the protected working path;

determining a working path link linking the source node and the first working path node;

receiving a set of wavelength reservations for a set of protected links on a set of protection path links;

calculating a set of a normalized differences between a maximum wavelength reservation on a protection path link and a wavelength reservation on the protection path link for the working path link;

determining a set of possible protection paths for the working path link;

determining a set of possible protection path widths from the set of possible protection paths;

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selecting a maximum possible protection path width from the set of possible protection path widths;

if the number of possible protection paths is greater than one and the possible protection path maximum width is greater than zero then randomly selecting a protection path;

if the number of possible protection paths is greater than one and the protection path maximum width is equal to zero then performing the following:

determining the number of protection path links of zero width included in each possible protection path; and

selecting the possible protection path with the fewest number of protection path links of zero width; and

if the number of possible protection paths is equal to one then selecting the one possible protection path.